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The Smartphone Privacy Dilemma | Tools to Ease IT's Pain

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SPOTLIGHT OPEN SOURCE

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"Today, making decisions without data is inexcusable."

THORNTON A. MAY, IN "IT'S THE DATA, STUPID," PAGE 56

Sick and Tired of IT Taking the Blame

I enjoyed Frank Hayes' March 7 column, "Seven IT Lessons from the Collapse of Borders." It was a great Monday morning wrap-up.

But I do take issue with one statement, where he says that "no one in IT was able to convince management to reinvent Expert." Expert was Borders' inventory management system, and Hayes points out that it was unable to scale as Borders grew.

Why is IT being made the scapegoat once again for C-level incompetence? I think that Expert's shortcomings would have been pretty obvious. I can't imagine that one needed an MBA to see how the system (and I'm not just talking about technology) was failing. Hayes seems to imply not only that IT staff were the only ones who could see the problem, but that IT was also the only one responsible. Really?

If the fall of Borders was IT's fault, then what were the executives responsible for?

I'm growing tired of IT taking one for the team. And it's one thing when Marketing and other departments pin one on IT. Let's face it, they're not going to admit any guilt themselves. But why is Frank Hayes reinforcing a myth and a stereotype?

Mark Simchock, *chief alchemist, Alchemy United*

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iPad 'Review' Lacks Objectivity

"Apple's iPad 2 Is the 'Holy Grail' of Computing" [*Computerworld.com*, March 13] does not meet the minimum standards for critical evaluation of a product, and the writer at times sounds more like an apologist for Apple than an objective reviewer.

I am not an Apple-basher at all, but I think that any product evaluation should be objective and critical.

Seriously, would any "Holy Grail of computing" today lack a USB port?

Mark Pitcavage

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TABLETS

Big Pharma Gobbles Up iPads for Sales

PHARMACEUTICAL sales reps are under pressure to find better ways to engage doctors during sales visits. Time-pressed primary care physicians typically give salespeople only 30 seconds per interaction.

Some medical specialists have more time than that for sales calls, but sales representatives "still struggle with their ability to differentiate themselves through clear, concise, and interactive messaging," Eric Newmark, an analyst at IDC Health Insights, said in a blog post last month.

The pharmaceutical industry apparently has a solution to the problem: Buy a bunch of Apple iPads to give salespeople "a quicker, lighter and more attractive way of displaying drug-related information," Newmark wrote.

Most companies are showing no interest in rival tablets in their headlong rush to the iPad, he said, and they aren't waiting for vendors to release salesforce automation applications that are optimized for the iPad.

"Several major pharmaceutical companies are putting the cart before the horse by purchasing iPads in large quantities prior to even owning a single application to run on the iPad," Newmark said. "More than one company has told us they have already purchased iPads in significant volume and are storing them for later use," when sales apps become available.

Newmark concluded that "the skyrocketing adoption of iPads in pharma sales and marketing" will put Apple in a great position to "quickly become a dominant hardware vendor" in that market.

– *Mitch Betts*

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OUTSOURCING

Analyst: China Poised to Grow In IT Services

The top 10 Chinese outsourcing providers employ a total of 85,000 people. That may sound like a lot, but it's small relative to the number in India, where one outsourcing firm alone employs 187,000 people.

Yet China's IT service providers are in a good position to grow in the years ahead, according to outsourcing consultancy TPI.

"What's interesting, and perhaps coincidental, is that the size of the leading Chinese providers today by employee and revenue is roughly equivalent to the size of the leading providers in India a decade ago," said Michael Rehkopf, a partner and director at TPI.

Rehkopf said he won't be surprised to see "Chinese service providers take off quickly and dramatically in the decade ahead."

But what could hurt China's outsourcing growth is increasing competition from other nations, and intellectual property protection issues, Rehkopf added.

China's outsourcing industry may not focus on the U.S. market like India's has, predicted John Keppel, TPI's president. Whereas the major Indian IT service providers count on business from U.S. customers for more than 50% of their revenue, China-based companies have a substantial domestic market to tap, as well as the large economies of nearby Japan and Korea, he said.

– PATRICK THIBODEAU

ANDREY KISELEV

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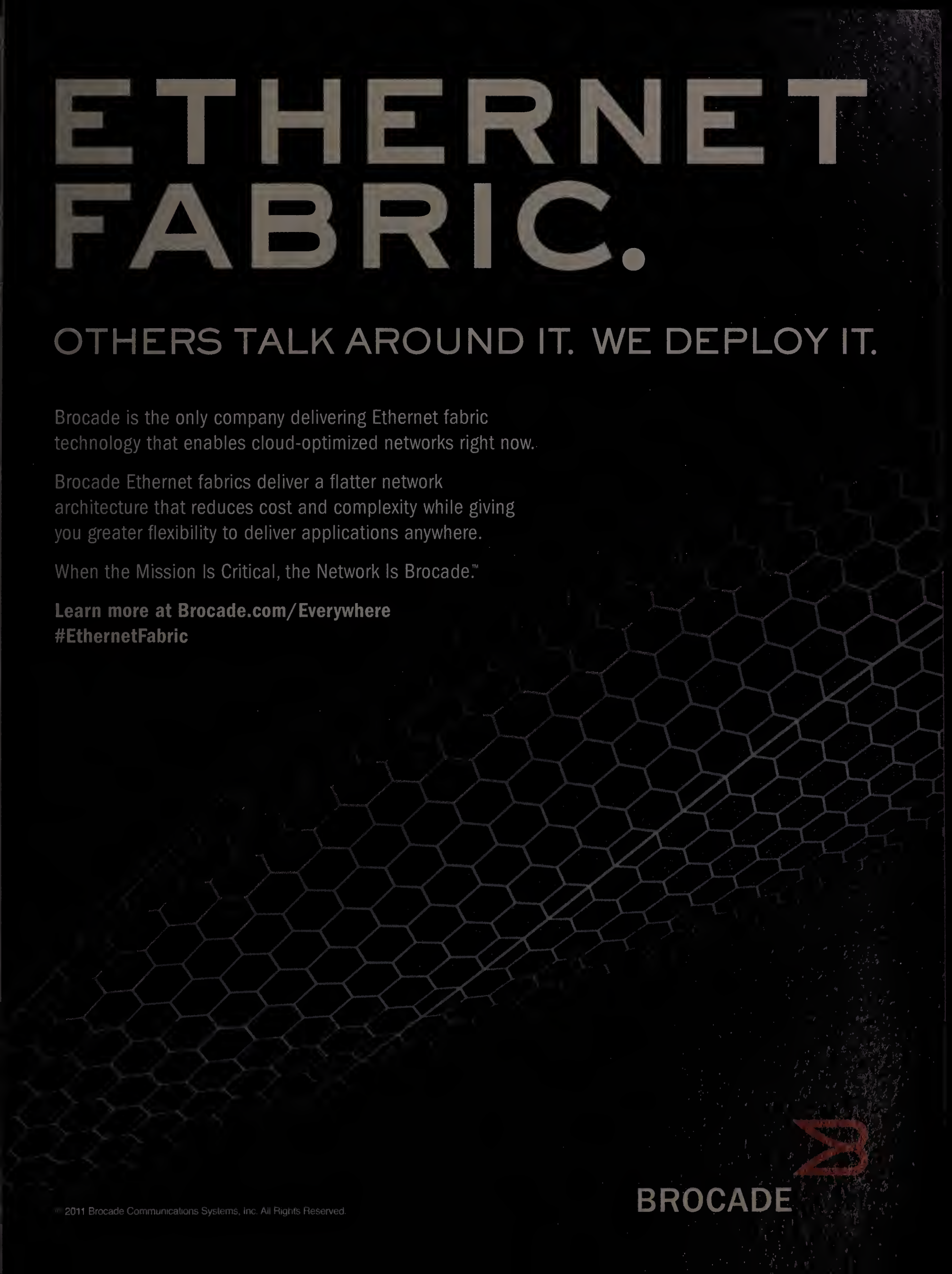

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BETWEEN THE LINES
By John Klossner

SECURITY MONITOR

Phishing Becomes More Sophisticated

THE SUCCESSFUL use of phishing emails to breach secure organizations like Oak Ridge National Laboratory and EMC's RSA security division is a stark reminder of the serious threat posed by a type of attack that was previously dismissed as low-tech.

The Oak Ridge lab last month disclosed that sophisticated data-stealing malware had infiltrated its networks. The breach originated in a phishing email sent to about 570 employees. The email was disguised to look like a memo about benefits changes written by the lab's HR department. When a handful of employees clicked on the embedded link in the email, malware was downloaded to their computers.

Such emails now appear to be the preferred method for breaking into corporate networks, said Anup Ghosh, founder of security firm Invincea.

"You only need a very low click-through rate to establish several points of presence inside an organization," Ghosh said. "If you have 1,000 employees in your organization and you train them all on not opening untrusted attachments, you'll still have someone doing it. This is not a problem you can train yourself out of."

Exacerbating the problem is the growing sophistication of phishing campaigns.

Organized cybercrime groups are using convincingly crafted emails to target high-level executives and employees within the organizations they want to attack. In many cases, the phishing emails are personalized, localized and designed to appear as though they originated from a trusted source.

Increasingly, information from social networking sites such as LinkedIn and Facebook is being used to make the targeted phishing attacks harder to detect, said John Pescatore, an analyst at Gartner. "With all the personal information and friends lists people expose on those sites," he added, "it is not that hard to craft a very personal-sounding email."

– *Jaikumar Vijayan*

Micro Burst

The Obama administration plans to close

137

data centers this year. The total floor space is equal to 5.5 football fields.

MOBILE MARKETING

Visa, Gap Send Discount Offers To Cellphones

Credit card company Visa and clothing retailer Gap announced last month that they're using SMS text messages to deliver updates about promotions and discounts to Gap customers' mobile phones.

The system, which uses Visa's global processing network, will be expanded to retailers nationwide, Visa said, although no timeline was announced.

Gap and Visa began a pilot of the real-time text message system in November. Customers enroll via a secure website and are sent Gap offers when they use Visa cards to complete transactions that meet certain criteria – for example, if they buy something at a store in a specified ZIP code. Once the offers appear on their phones, the customers can take advantage of them by showing the text messages to Gap sales clerks.

Visa said that high-speed transaction processing helps retailers reach potential customers with new offers while they're still out shopping.

Amy Carr, director of customer relationship management strategy at Gap, said the Visa system has given the retailer new insights into its customer base, leading to improvements in the way it targets promotions to people.

→ MATT HAMBLEN

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NEWS ANALYSIS

Amazon Service Outage Reinforces Cloud Doubts

The incident could curb business adoption of hosted application or storage services. By Patrick Thibodeau and Jaikumar Vijayan

THE PROLONGED OUTAGE of Amazon.com's EC2 cloud service late last month could set back adoption of hosted services by giving some companies — especially those that are on the fence about migrating to the cloud — a strong argument for taking it slowly.

For other organizations, Amazon's problems reinforced an already-held belief that cloud services can't match an enterprise IT operation when it comes to meeting the technology needs of business or government entities.

More than a week after the days-long partial outage started on April 21, Amazon released a detailed 5,700-word postmortem and *mea culpa* that identified the culprit as a configuration error that occurred during a network upgrade.

"The recent outage confirmed, for us, that cloud services are not yet ready for prime time," said Paul Haugan, CTO for the city of Lynnwood, Wash. The city had been looking into Amazon's cloud offerings, he added.

"Cloud services [as a whole] need some more maturing and a much more hardened infrastructure and security model prior to our adoption," Haugan said.

Jay Leader, a senior vice president and CIO at iRobot, whose products include the Roomba vacuum cleaner, said the Amazon outage illustrates well the limitation of cloud computing.

"We don't use Amazon or any other public cloud services, and we won't, perhaps ever, or at least until there is much more transparency about where the data lives, who controls where it lives and when and where it moves, and lots of other things," Leader said.

Analysts noted that the Amazon incident further increased IT concerns about application availability and the security of cloud services.

"Obviously, these issues are very heightened right now and will continue to be so for quite a while in light of the outage," said Gartner analyst Kyle Hilgendorf. "Amazon portrays an aura of invincibility, whether intentional or not, and this outage is going to remind enterprise customers that nobody is perfect and increased due diligence is required."

Hilgendorf said IT managers remain most concerned about cloud security — including whether user authentication and access control measures are adequate, how much access a service provider has to a customer's systems and data, and the potential for an accidental release of protected data.

The Amazon outage also reinforces the fact that there's no way to directly migrate customer data to another provider, said Arun Taneja, an analyst at Taneja Group. If a service goes down, the host company must return the data to its customer, which then must find another provider or revert back to storing it locally, he said.

Coupled with recent decisions by EMC, Iron Mountain, Cirtas Systems and others to shut down or scale back hosted storage offerings, the Amazon incident could spur a backlash against cloud storage services, even though they can offer good value, Taneja said. ◆

Lucas Mearian *contributed to this story.*

> The recent outage confirmed, for us, that **cloud services are not yet ready** for prime time.
>
> CTO, CITY OF LYNNWOOD, WASH.

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Google Apps Tops Exchange at Cinram

Citing cost and service issues, the DVD maker decided against upgrading from Microsoft Exchange 5.5 and turned to Google Apps instead. By Sharon Gaudin

> **Google has stepped in** and grabbed a foothold in the enterprise. It's been very impressive.
>
> ANALYST, CURRENT ANALYSIS

CINRAM INTERNATIONAL is on the verge of completing a nearly yearlong migration from Microsoft Exchange to Google Apps, a move that an IT executive at the maker of DVDs, Blu-ray discs and other media called a "no-brainer."

Andrew Murrey, vice president of IT infrastructure at Cinram, said the company decided to switch to Google's cloud offering last year to avoid the high price of upgrading Exchange and because it wasn't happy with Microsoft's customer service.

"[Google] was much better," Murrey said. "It was a night-and-day difference."

Analysts say Cinram's move is the latest example of corporate IT's slow but steady acceptance of the productivity suite from Google, a vendor long known primarily for its search engine.

"Google has stepped in and grabbed a foothold in the enterprise," said Brad Shimmin, an analyst at Current Analysis. "It's been very impressive."

Microsoft, Shimmin said, has never been "a high-touch" company, but the software vendor may have to change its approach if Google becomes increasingly popular among IT managers.

Toronto-based Cinram has more than 10,000 employees and operates 20 facilities in North America and Europe.

The company began to seriously consider upgrading from Microsoft Exchange 5.5 — an email system first released in 1997 — early last year. Before that, Murrey said, "we could never present a business case that showed a significant cost savings. It was always cost-prohibitive."

Last spring, Murrey learned that the cost of moving to the cloud version of Exchange, including implementation, would be $180 to $200 per seat per year, which was considerably higher than he expected.

Murrey said Microsoft and partner companies told him that a migration from Exchange 5.5 would be difficult — and expensive — because "there's no native migration tool to get our data into a format that would be usable."

Microsoft said that the price it quoted Cinram was specific to that job.

Cinram was spending about $225 per user per year to run Exchange 5.5. In contrast, Murrey said, Google's online office apps cost $83 per user per year. "It's a no-brainer," he said. "We were spending $225 per user for Exchange, and now we're getting new features and tools for a third of the price."

He noted that Cinram will be using all of the apps in the Google Apps toolbox, even though the company initially looked at email alone.

Murrey also said that Google technicians were very helpful during the migration, which began last July with a pilot system used by 25 employees. The vendor sent engineers to a Cinram facility to help with the deployment.

Google's hands-on approach may be a sign that the company is "maturing as a software vendor," said Shimmin. "They understand the need for the consultative side of the business and what customers need. I've seen a lot of evidence [of that] in the past 12 or 18 months."

Murrey estimates the initial cost of running Google Apps at about $700,000 annually. "Because we're still in the migration phase, there's all those expenses for moving data and everything," he said. "We're hoping to get that $700,000 number down to close to half a million [dollars] a year." ◆

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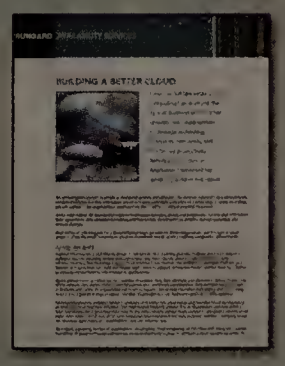

Download the white paper "Building a Better Cloud" at: sungardas.com/cloud11

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SUNGARD AVAILABILITY SERVICES

THE Grill

Cheryl Whitis

This Raytheon CIO worked to gain control over her department's budget.

Something most people don't know about you: I love to travel, and when we go, I like to do things like zip-lining through the jungle canopies. I've done it a couple of times, in Costa Rica and Jamaica.

Technology you could not live without: I am terrible with directions, so to me GPS systems are the most wonderful inventions.

Favorite nonwork pastime: We spend quite a bit of time boating with our family. Our sons live nearby, and I have two grandsons now, a 4-year-old and a 4-month-old.

CHERYL WHITIS *is vice president and CIO for Raytheon's Network Centric Systems, a group with 13,000 employees, 8,000 of whom are engineers and scientists. Working in the aerospace and defense field is a passion for her, one she discovered almost by accident with her first job at Northrop Worldwide Aircraft Services. The industry holds a personal significance for her as well: Both her father and father-in-law are career Army servicemen, and Whitis takes pride in the fact that she contributes to U.S. national defense and the protection of its war fighters.*

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Continued on page 14

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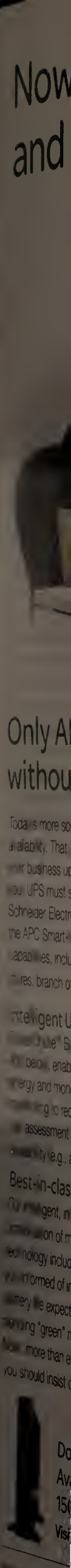

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“I always try to tell people that there is not just one way to get to the top. There are lots of different paths.

Continued from page 12

itself or the actual tanks, but a lot of our products go onto the aircraft or go in the tanks. We had been used to just delivering our products and having some afterlife support, but more and more we have what we call “product life management.” From the time you conceive the design until your customer retires that asset from its portfolio, we are responsible for all of that support, and that drives a lot of requirements on the IT organization. So I think we are uniquely positioned to help grow our business by providing all of the tools necessary to do that.

What IT and security challenges do you face? While many companies have to worry about export regulations, we also have to worry about ITAR — International Traffic in Arms Regulations — because of the products we produce. I think that our security concerns are even more substantial, because if we have a breach, it is even more dangerous for the U.S.

A growing concern for us is the consumerization of IT products. I can remember a time when employees weren't allowed to bring cellphones in because they had cameras. The amount of data that you can store on these portable devices represents additional risks for us. We spend a lot of time educating employees on security matters and safe ways to use consumer technologies. We have been spending time on digital and information rights management, trying to put multiple layers of security around the data that we protect. At the same time, we are trying to invest in how we adopt more of this consumerization of products. I would love to see a time when we could really be device-agnostic and not have to control all of that so intensely.

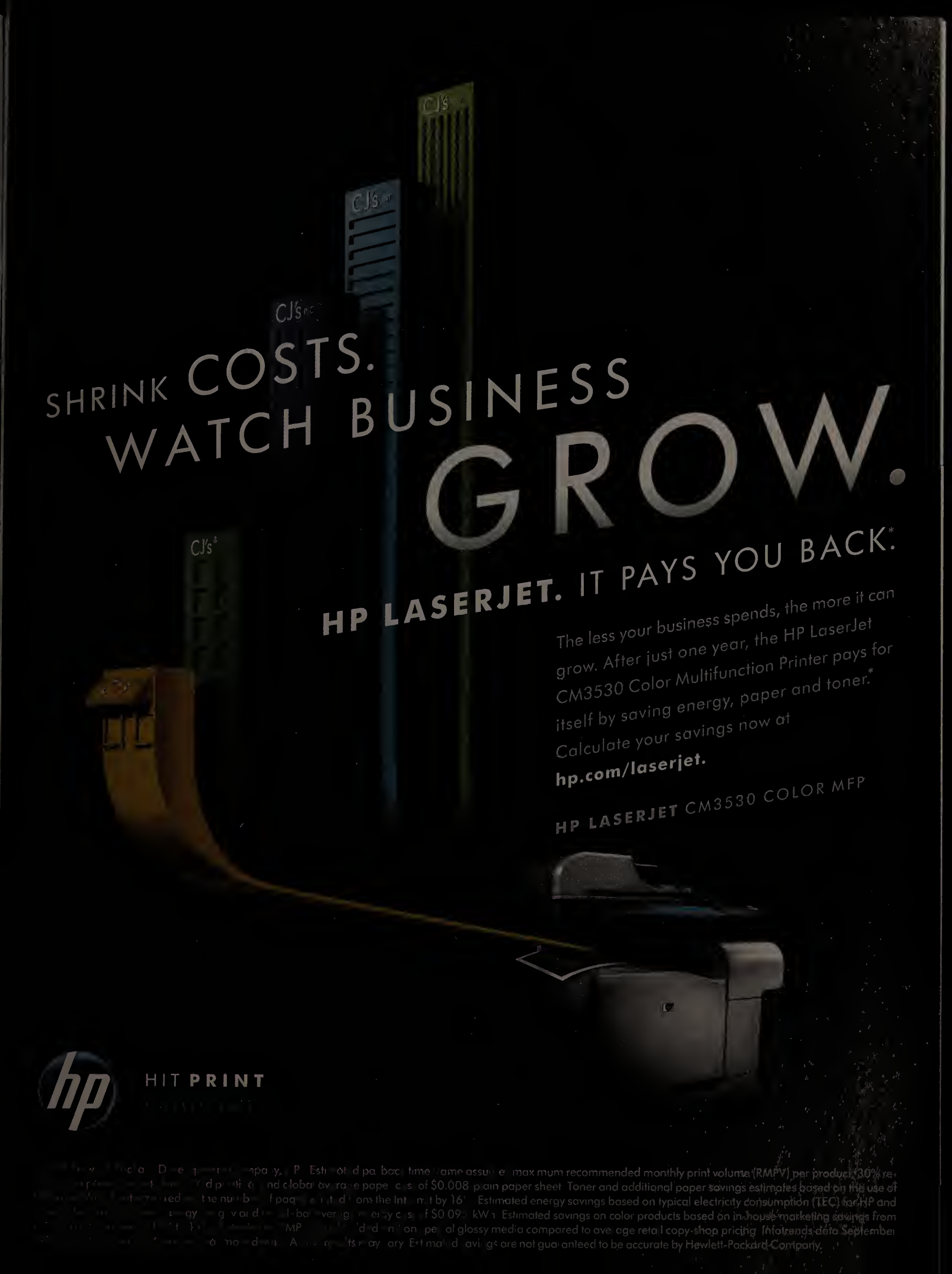
You implemented some changes when you took your current position. Did you encounter any challenges or resistance when you began reorganizing? One was that the business really didn't see IT as a major part of the delivery of their product. It was more the traditional “make sure my desktop is working.” Budget for our key products was actually held and managed in the other functions. There was little strategic planning across the company of where we needed to put our investments. I had to work with my peers to get my budget back, and we set up a governance with our business partnership council on what we would do with those large investments. We didn't want to be restricted by the budget [as to] where we put our efforts. And for the first time, it made them aware of what was important to other functions and other parts of the business.

You spoke at a Women in Technology International summit in 2001, to women who wanted to become CIOs or CTOs. What advice would you give today to women who want to advance their careers, both in IT and in other industries? I don't know that these things are specific to one gender anymore. I have seen young women think that they have to operate the same way that a man would, and I always try to tell people that there is not just one way to get to the top. There are lots of different paths. I personally took a couple of years off when my first son was born. You don't have to have a role model in the exact position where you aspire to be that is exactly like you. You need to be well rounded, but you just really need to be the best that you are, and you are going to be unique in what you bring to those leadership roles.

Leadership is looking for someone who brings a different skill and ability to the role so that they have a very well-rounded leadership team. But in IT, I do think that women have to think about the business, not just the technology. The higher up you go, the broader your skill sets need to be and the more they need to focus on understanding the business and how IT can bring value to the business. It is important to cultivate both aspects — the technology and your knowledge of the business.

What challenges do you think women in IT face? It is a challenge that we do not have more women in those positions that we aspire to get to. I think it is a challenge for people of color as well. Raytheon is doing a fabulous job in that area. Aerospace and defense companies get stereotyped as not being too forward-leaning on things like that, and to some extent there are probably some ways we are not, but I think we have created a good balance. Our retention rate for our young employees, particularly women coming in, has improved significantly. But something that our company is very concerned about is women in math and the sciences. We are not graduating enough people in general with those skills. So a big concern we have in our company, as the boomers start retiring, is how we fill those science positions.

— Interview by **Rebecca Linke**, *a writer and editor living outside of Boston*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PRESTON GRALLA

Smartphone Privacy: IT Caught in the Crossfire

> Normally, anything done on a company's hardware is considered rightfully accessible to the business. But should that include location data?

THE NEWS that iPhones, iPads and Android devices secretly track the locations of their owners poses a potentially serious dilemma for IT staffs. If someone's manager asks IT to retrieve that data and hand it over, what should IT do? We certainly have to acknowledge that a device that's used for business purposes but automatically tracks personal information blurs the line between personal and corporate information.

First, a bit of background. It was recently revealed that iPhones and iPads track their owners' locations and store that information in unencrypted files on the devices and on the owners' computers. Android devices do the same, but the files aren't also stored on computers.

In the case of iPhones and iPads, approximately 100 data points — in other words, precise information about places the user has visited — are logged every day. A single file can have tens of thousands of these data points.

Because the files containing these data points can be found on employees' computers, the IT staff has easy access to them. And even in the case of Android devices, where the data is stored only on the phones themselves, IT staffers can get access to them as well, by simply taking possession of the devices.

Normally, anything done on a company's hardware is considered rightfully accessible to the business. Email and information about the websites a user visits aren't considered private — the company has the right to examine it.

That standard would seem to apply as well when the hardware is a smartphone or a tablet. Email, Internet and app use would fall under the dominion of the business, just as they would with a PC, and could rightfully be examined. But can that guideline be extended to location data? Employees are often required to carry company-issued smartphones at all times, including after work and on weekends. And now we know that as they do so, their movements are being tracked, with the data stored in a file.

Legally Hazy

So I'll ask the question again: Does the user's employer have the right to examine that data if it owns the devices it's stored on? And if it does, *should* it do so? Is it really an employer's business if an employee goes to his daughter's softball practice on a Saturday afternoon? How about if an employee goes to a strip club on a Saturday night? Even though I don't frequent strip clubs, I want to say no, that information should remain private. But if the information is stored on a device that belongs to the employer, it's a hazy legal issue.

IT staffs, which have the technical capability to gather the location data, will inevitably be caught in the crossfire when this question arises. But until companies develop clear, legally valid guidelines about what information can be gathered and what can't, IT shouldn't do it.

And this is only one of several complicated issues on the horizon. For example, when someone uses a personal smartphone to conduct company business, is everything on the phone fair game for the enterprise?

The upshot: If you're in IT, get your company to develop clear guidelines on smartphone data now. If you don't, it'll come back to bite you in the future. ◆

Preston Gralla is a *Computerworld.com* contributing editor and the author of more than 35 books, including *How the Internet Works* (Que, 2006).

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OPEN SOURCE'S PEOPLE PROBLEM

Projects are multiplying, yet a **shortage of in-house skills** could slow them down. BY MARY BRANDEL

MIKE MILLER, director of security at Media General, is a big fan of open-source tools, particularly for use in security. "I joke that it's because I'm cheap," he says. "But the fact is, there are solid open-source security products that have been around a long time."

The independent, publicly owned communications company in Richmond, Va., migrated to Red Hat Linux several years ago, and it uses a variety of open-source security tools, including the Nessus vulnerability scanner and Snort intrusion-detection software.

» Media General's Mike Miller likes open-source applications but says it can take up to a year for an employee to grow really comfortable with some tools.

But there's a catch: Whereas users can receive training from Red Hat and even become certified in Linux, they're on their own when it comes to the security applications. "It's more a matter of getting to know the application, using it and researching it on the Web," Miller says. He tends to hire internally for his team, and so far all of his people have had to learn on the job. While the basics come pretty quickly, Miller says, the tools are more difficult to master than their commercial counterparts, and it might take a year to become really comfortable with some of them.

Across industries, demand is growing for people with open-source skills because the number of open-source projects is on the rise. In fact, one of the first challenges enterprises face when adopting open-source applications is that they might not have the skills they need in-house. In a survey conducted by *Computerworld* in March, 56% of the 159 respondents said that they expect their organizations' use of open source to increase in the next six months. In a *Computerworld* survey last year, 47% of the 143 respondents said they anticipated an increase. More than half (51%) of this year's respondents also said their use of open source had increased in the previous six months (see charts at left).

In the March survey, 57% of the respondents pointed to a lack of in-house skills as the No. 1 perceived barrier to open-source adoption. Moreover, staff training was cited as the most costly aspect of an open-source software implementation.

"The biggest benefit of open source, in addition to the cost savings, is development speed," says Alice Hill, managing director of Dice.com. "But if you have to spend all your time training your C++ developers in Ruby on Rails, you might lose that benefit."

Dice.com is seeing demand for open-source skills in its job postings. Since 2010, the number of postings for all technology jobs has grown by 25%, whereas the number of postings seeking people with Linux, Python or Ruby on Rails expertise has grown 31%, 53% and 84%, respectively (see "Right Skills, Right Time," page 24). In some cases, employers are offering higher salaries to people with open-source skills. While IT salaries have been generally flat year over year, salaries for people who know Python are up 7.1%, and salaries for those with Perl expertise are up 4.3%. "We're definitely seeing larger increases for these scripting languages," says Hill. "People are willing to pay more for those."

Additionally, IT professionals skilled in Linux tend to earn as much as 10% more than their peers, according to Dice. The average salary for people familiar with Red Hat and Novell SUSE Linux is $87,500, compared with $79,000 for IT workers overall.

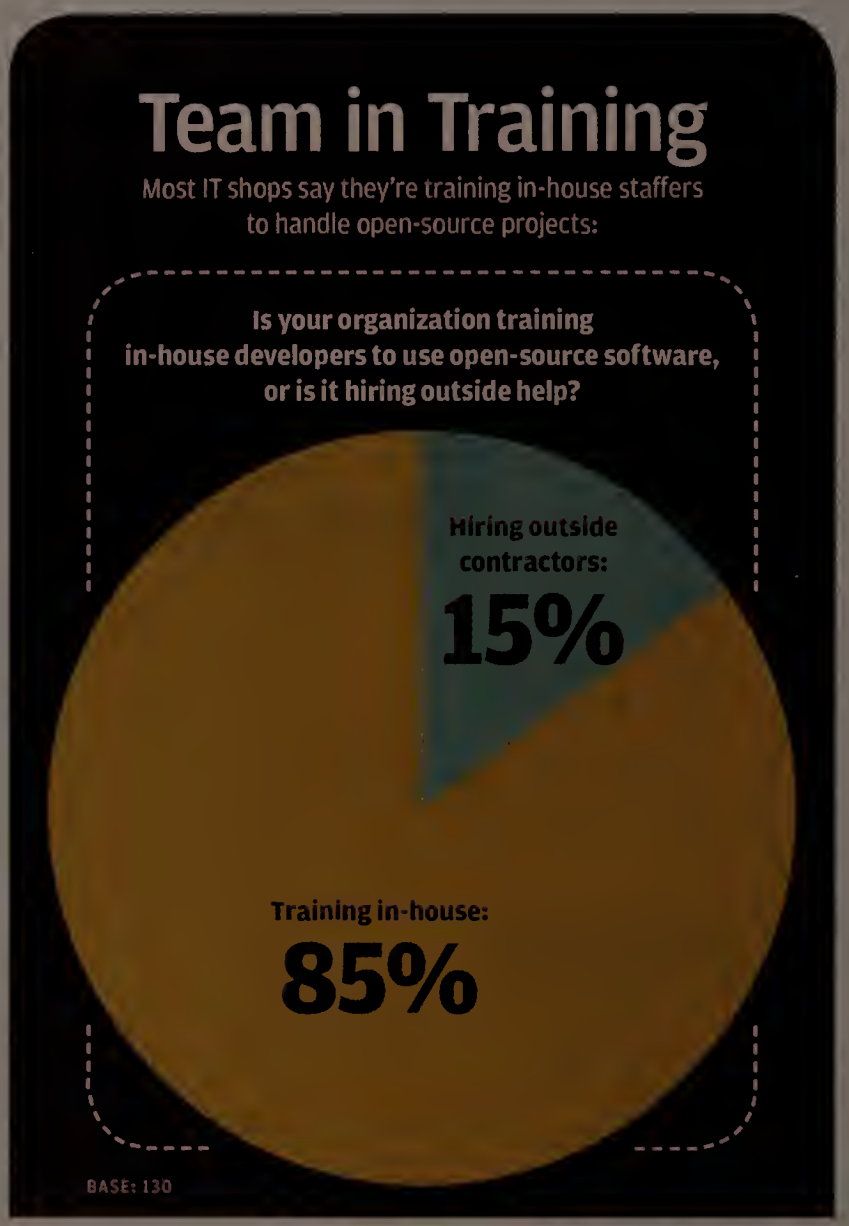
Companies that need open-source skills are offering all kinds of working arrangements, says Hill, noting that job postings are evenly distributed across full-time, contract and telecommuting positions.

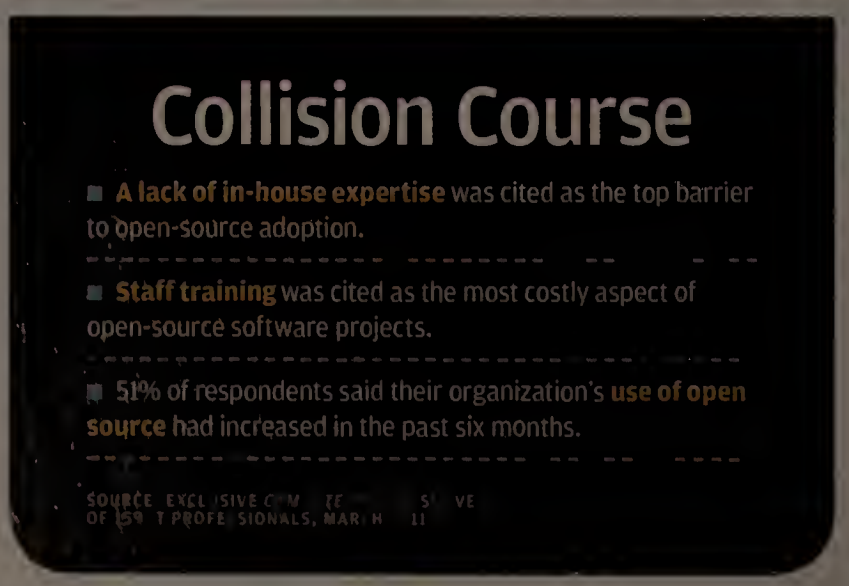
Feeling Their Way

A paper published in the March 2010 issue of the Association for Computing Machinery's *Communications of the ACM* magazine also cited a dearth of expertise as a barrier to open-source adoption. According to the paper, titled "The Organizational Adoption of Open Source Software: Barriers and Remedies," the problem is threefold: Companies may be unaware of open-source applications that are relevant to their businesses; managers may be aware of open-source applications but lack the knowledge required to implement them; or managers may be unaware of the support services available to assist with implementation, since open-source software projects are often run by volunteer organizations that don't have big marketing or advertising budgets.

John Biderman, director of strategic development and information technology at Harvard Pilgrim Health Care, agrees that it takes time to develop the in-house expertise needed to support open-source initiatives. Harvard Pilgrim, a Wellesley, Mass.-based health insurer, has implemented MediaWiki, a free open-source wiki package written in PHP, but its IT department is a Java shop, and the staffers had no particular PHP skills. "We had one guy who knew enough to use the config files and set things up, but no PHP expertise," Biderman says. As a result, he adds, "if we wanted to modify the system at all or extend it, we wouldn't be able to."

Version management is another challenge. "The open-source





The biggest benefit of open source, in addition to the cost savings, is development speed. But if you have to spend all your time training your C++ developers in Ruby on Rails, you might lose that benefit.

ALICE HILL, MANAGING DIRECTOR, DICE.COM

community is constantly modifying, extending and adapting open-source components," Biderman says. He's looking into software from a German company that would support version control on MediaWiki. But in the meantime, he's avoiding any upgrades or improvements to the system. "I'd like to be in a more flexible mode, where I can stay current with latest releases, and that would be by purchasing a turnkey version with a support package," he says.

Hard to Find, Hard to Keep

At Media General, Miller has found that employees who master open-source security tools tend to get lured away to more challenging positions that pay more. "I refer to them as 'graduates,' " he says. "As people become senior, especially in security, they want more challenges than we can offer them at a media company, so they grow here and get more somewhere else."

But Miller intends to continue developing skills internally because his other option is to pay salaries that he can't afford. "Those who are knowledgeable in open source tend to be more senior people with more experience, so there's a huge difference in salary," he says. In fact, after struggling to hire Linux employees — positions sometimes remained open for months — Media General ended up outsourcing its Linux initiatives. Miller says one of the reasons he faces such challenges is because Media General is a midsize employer in a job market with bigger and better-paying Linux shops.

Carl Weddle, director of IT at Quality Trailer Products, agrees that location has a lot to do with finding open-source talent. Located in Azle, Texas, just west of the Dallas/Fort Worth metropolitan area, the manufacturer switched to Linux several years ago and then adopted open-source reporting, business intelligence, database, security and content catalogue tools. It also uses the open-source LAMP stack for Web services. Half of Quality Trailer's desktops now use OpenOffice, and the company has standardized on the Firefox browser. Weddle estimates that 60% to 75% of Quality Trailer's computing systems rely on open-source software.

However, it's much more difficult to find people with open-source skills in Azle than it is in the larger cities. "Over here, the old saw about 'No one ever got fired for using IBM and Microsoft' holds pretty good sway," he says. When an employee with

Continued on page 24

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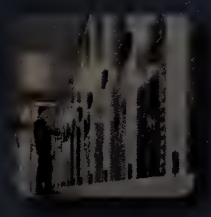

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Right Skills, Right Time

OPEN-SOURCE SKILL	PERCENTAGE CHANGE IN JOB OPENINGS FROM 2010	PERCENTAGE CHANGE IN SALARY, 2009-2010
Ruby on Rails (programming language)	+84%	-0.6%
Python (programming language)	+53%	+7.1%
MySQL (database)	+46%	+0.1%
PHP (programming language)	+43%	+1.1%
Ajax (programming language)	+37%	-4.3%
Linux (operating system)	+31%	-0.3%
Perl (programming language)	+25%	+4.3%
Apache (Web server)	+24%	-2.5%
Tomcat (application server)	+24%	-3.0%
Red Hat Linux (operating system)	+21%	+1.3%

SOURCE: DICE.COM

Continued from page 21

open-source skills left the company a few years ago, Weddle did find a replacement — but he paid for it. "I ended up paying a little more than market value to get someone with deep knowledge and enthusiasm for open source," he says.

At ACP Interactive, a San Francisco-based marketing firm, IT Director Ed Skokowski says he too has lost staffers who have moved on after getting experience with an open-source application — in his case, Perl, which ACP uses extensively.

Building the Skills

In light of the salary premiums companies have to pay to recruit people with open-source skills, it's no wonder the preferred method of acquiring such expertise seems to be training in-house staff. In *Computerworld*'s March survey, 85% of the respondents said they chose that option instead of hiring outside contractors.

To Skokowski, teaching open source is like teaching an old dog new tricks. ACP has migrated about 80% of its Windows servers to Linux, and while those systems are now up and running, Skokowski says there were a few false starts over a five-year period. "Just getting the printers to work was a two-to-three-day chore," he says. "If you've lived in Windows a long time, you get used to the idiosyncrasies of getting it to work, and it's the same thing in Linux."

For instance, Skokowski says he has encountered discrepancies between what the Linux command line shows and what you see through its graphical user interface. He once made a change to an IP address through the GUI, but the system didn't reset. The problem was apparent in the command line but not through the GUI. "You have to know how to navigate via the command line really well," he says.

In another case, servers were automatically turning off at night. The solution turned out to be simple, but it was an obscure problem that required research on online forums to resolve, Skokowski says. What's nice about open source, however, is that when you do encounter a problem, you can capture a screenshot and pop it into Google to see if other users have a solution, he says.

Skokowski's staff mainly learned about open source through hands-on training, although he enrolled himself and a couple of others on his then-10-person team in a couple of systems administration courses at the University of California, Berkeley. "We set up a server and gradually built more machines to get more experience with it," he says. They also read books and visited online forums like LinuxQuestions.org. "The community is so good, there really hasn't been much we haven't been able to solve," he adds.

At Media General, Miller trains new hires in-house. "The tools themselves are good; they just take a little longer to learn than commercial tools," he says. For instance, you can quickly learn to do a security scan with Nessus, but running a nonintrusive scan rather than an intrusive one, and knowing the ramifications of each, is a matter of using the tools in different circumstances over time — maybe six months to a year.

Miller says vendors try to make commercial tools easy to use, with demos, GUI wrappers and lots of help files. "That's a big selling point, because it makes it easy for someone who doesn't have a lot of experience to walk in and do what they need to," he says.

Both Nessus and Snort offer subscriptions for a limited amount of support. For instance, you can get help if you're loading a pattern file incorrectly or the scanning engine isn't updating, "but you're not going to get the nitty-gritty of how to schedule scans," Miller says.

Although he tries to hire internal staffers who are sharp and seem to be at ease learning new skills, one recent internal hire happened to be an experienced Linux administrator and "a total command-line junky" who compiled his own Linux kernels and preferred open source to commercial tools to grow his skill set. Nonetheless, after six months on the job, the employee was still

becoming familiar with the types of alerts coming through and learning how to respond to them. "Because some alerts only show up every few months, it might be a year before he realizes [a certain] alert is something he needs to fix," Miller says.

Setting the Stage

Meanwhile, Weddle says not all employees are up to the task of learning open-source skills. "It's heavily personality-dependent," he says. "If you have someone antagonistic to the open-source idea, they'll be hard to train. But if they're open-minded or dabbled in both open-source and commercial technologies, it's quite easy."

A case in point was when his company first moved to open source. On his three-person staff, one employee blossomed during the migration, while another was less enthusiastic. "He began to pick up on it, but another opportunity came up and he jumped ship," Weddle says. "There are these odd religious wars. If someone is entrenched, they're just not going to change. But most folks are in the middle, and it's not that big a deal to get someone to switch. Many revel in it — they've never had a chance to play with this before, and they go for it."

David O'Berry, director of IT systems and services at the South Carolina Department of Probation, Parole and Pardon Services, agrees that it's the team itself that dictates the ease of the transition. "A strong development staff can absorb anything," he says. In his experience, training on open source is no different from training on any unfamiliar technology. "Six years ago, I went from PowerBuilder to .Net, and that was no easier than if I were going to J2EE," he says. "No matter what, when you move from one technology to another, there's going to be retraining."

Preparing a staff for open source can take time. At The Mitre Corp., CIO Joel Jacobs says the public-interest not-for-profit's success with open source is very much tied into its investment in development skills over the past five years and its emphasis on continual innovation. Mitre's main open-source initiative is its Linux-based intranet portal, developed over the past 18 months and now used by more than 7,000 employees.

For the past few years, Bedford, Mass.-based Mitre has been working to make sure it has the right skills in-house to do more custom development so it doesn't have to rely on commercial systems. "For some people, that was an easy transformation, while for others, it wasn't the right environment, "and they have moved on to more suitable opportunities," says Bill Donaldson, head of applications development.

It's not always easy to find the right staffers, say Donaldson and Jacobs. "We're seeing difficulty hiring across the board," for both custom code and open source, Jacobs says. However, the fact that Mitre offers opportunities to work with open source makes it more attractive to job hunters, he believes. Additionally, Mitre's efforts to create an engaged workforce that is working on things that matter to them makes it easier to recruit and train internally.

In the end, open-source proponents say the need for training shouldn't discourage companies from migrating to or expanding their use of open source. "Although we pay more for the troops, the lower costs and the lack of hassle when I want to change something makes all the difference," Weddle says. "When new business requirements come barreling down, it's so much easier to respond with the open-source stack." ◆

Brandel *is a* Computerworld *contributing writer. You can contact her at marybrandel@verizon.net.*

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OPEN SOURCE UNCHECKED

IN 2006, A BRANCH OF THE U.S. ARMED SERVICES wanted to know just how prevalent open-source software had become in its IT ranks.

The IT staffers knew that Linux and a few other open-source infrastructure apps were being used in "a couple of divisions," but they wanted to get a full understanding of that usage and then estimate the ROI to determine whether open source should be rolled out to other divisions. Consultants

Continued on page 28

As open-source use runs rampant, IT must **get a grip on governance** and figure out if it's really saving money. **BY STACY COLLETT**

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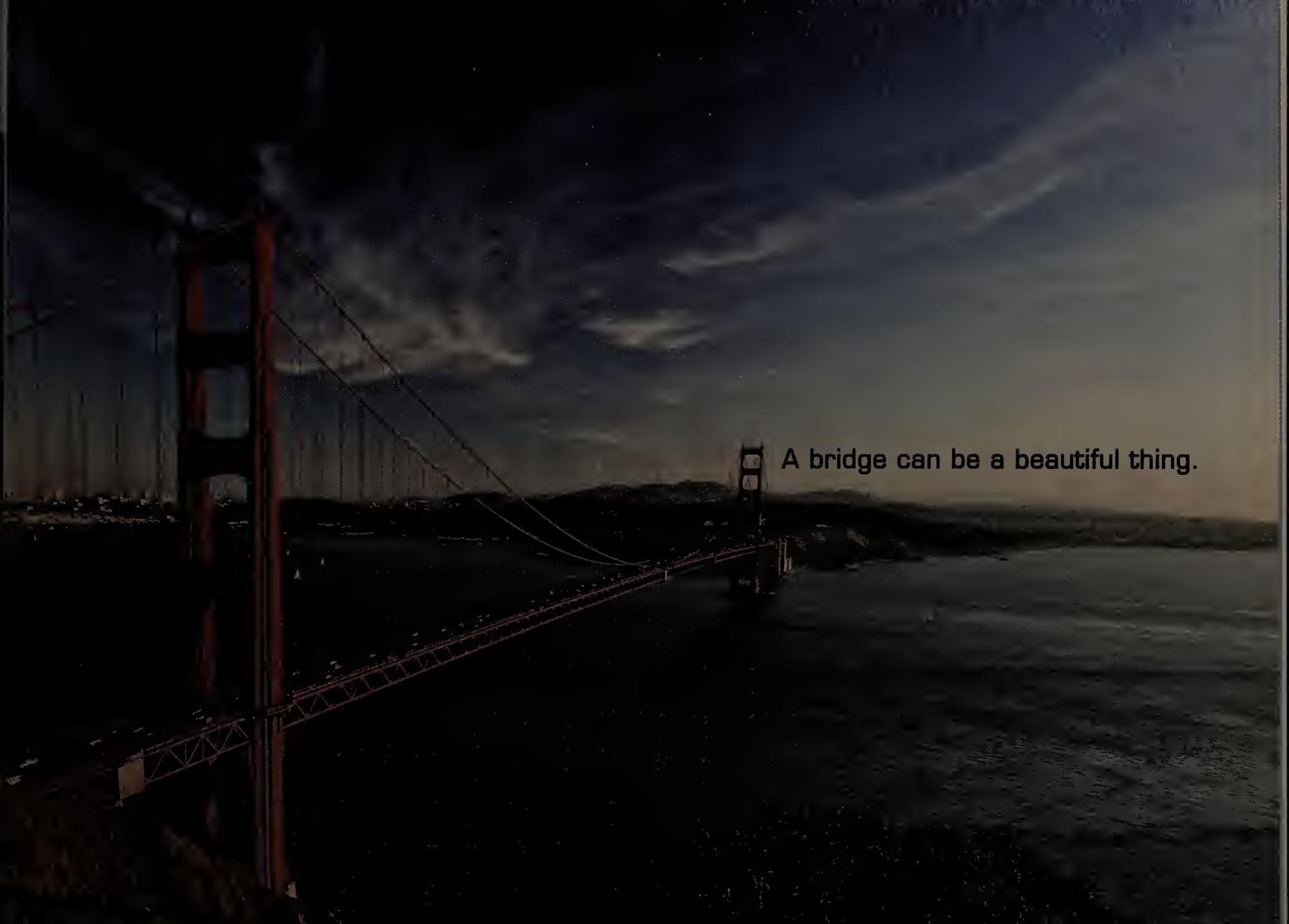

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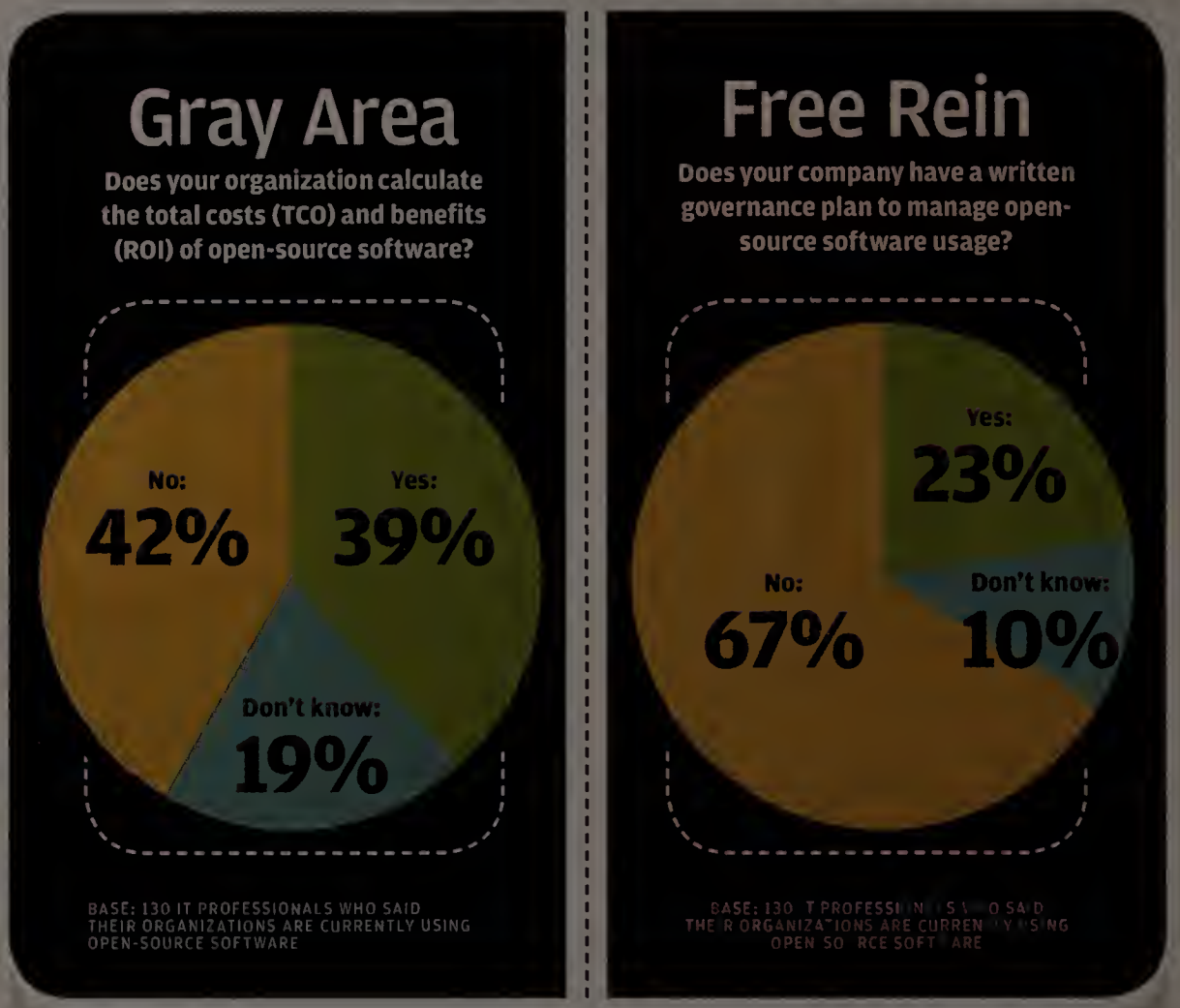

SOURCE: EXCLUSIVE *COMPUTERWORLD* SURVEY OF 159 IT PROFESSIONALS, MARCH 2011

Continued from page 26

from Olliance Group took a look at the service's operations and after three days came back with some shocking news: The military branch was already using Linux and other open-source applications in 75% of its divisions, and in half of those, open-source use had already reached mission-critical status.

Though the open-source train had left the station without IT management onboard, the consulting firm was able to determine that the various divisions using open source were seeing an ROI of 300% to 700%. But the military branch still had no governance plan over the use of open-source technology. Needless to say, "they have one now," says Andrew Aitken, a senior vice president at Palo Alto, Calif.-based Olliance, which was acquired by Black Duck Software in 2010.

It's happening in the commercial world, too, he says. With the proliferation of open-source applications, and with vendors moving from licensed models to software-as-a-service models, open source is in a state of rapid maturation. What's more, "in today's large distributed environments, [companies] do lots of their own developing across the globe, and they outsource a lot of development, so they really don't know what their partners may be using. So it's taking a while to develop the critical mass to get the attention of people who have the knowledge, experience and responsibility to develop ROI and TCO models," Aitken adds.

So it comes as no surprise that 42% of 130 open-source users responding to a recent *Computerworld* survey reported that they aren't measuring the return on investment or total cost of ownership of their open-source projects, and 19% said they don't know if they're measuring those things. And more than two-thirds don't have a written governance plan (see charts at left).

"In many cases, open-source users are basing their entire assumption for TCO on acquisition costs," says Mark Driver, an analyst at Gartner. "They assumed that in the long run, it will be cheaper," but they don't take into consideration hardware costs, training, consulting needs and the ramifications of downtime if a system fails.

"Most of [our clients] aren't measuring or don't care," Aitken says. "It's simply not in their lexicon to look at open source from an ROI perspective." They are more focused on creating business value than on saving IT dollars.

But others say companies can't be sure they're creating business value without running the numbers first, and having a governance plan is one of the best ways to get a grip on open-source costs — and keep the company from unwittingly getting tied up in legal battles over the use of proprietary software.

Hidden Costs, Hidden Value

Whenever an organization adopts a new technology, there's always a leap of faith that it's going to be cheaper, better and more secure. "Then it invariably gets justified backwards," says Stephen Walli, technical director at Outercurve Foundation, a nonprofit organization that works with commercial companies to facilitate their participation in open-source development projects.

Calculating ROI can be easy if you buy an open-source package like Red Hat Linux. But in practice, it's more difficult because there are so many open-source apps and so many usage models. "People are learning that there are other benefits," such as risk reduction or the ability to build a website without creating code

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Most of [our clients] aren't measuring or don't care. It's simply not in their lexicon to look at open source from an ROI perspective.

ANDREW AITKEN, SENIOR VICE PRESIDENT, OLLIANCE GROUP

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Continued from page 28

from scratch or buying an expensive development tool, Walli says.

The ROI argument that "open source is cheaper" is losing relevance, in part because more and more companies are citing quality, reliability and security as reasons for switching to open source, according to a 2010 study by Accenture.

"It's easy to say that [open source] will create value, but it's very important to be systematic on how you create value, to ensure that you're actually doing it," says Tomas Nyström, a senior director at Accenture who's responsible for open source. He advises companies to consider the entire life-cycle cost of using open source. That means estimating training expenses and assessing the long-term impact on the help desk, not just calculating the cost of equipment and staff, for example.

> It's easy to say that [open source] will create value, but it's very important to **be systematic on how you create value,** to ensure that you're actually doing it.
>
> **TOMAS NYSTRÖM,** SENIOR DIRECTOR, ACCENTURE

Other hidden expenses could include the costs of handling quality assurance and regression testing in-house, the creeping costs you incur if you end up doing a lot of software maintenance, and the potential cost of buying another system if the open-source software doesn't do what you need it to do.

Many CIOs choose to avoid ROI questions by focusing on value created for the business rather than IT cost savings, Walli says. Calculating ROI and TCO "is really hard to do," he says. "But it's often fairly easy to demonstrate that 'once this system was put in place, we were adding this amount of business to the corporation.' "

Governance Required

Why is governance so important? Ask Barnes & Noble. In March, B&N got caught in a patent infringement suit between Microsoft and the developers of Android. Microsoft filed suit against Barnes & Noble, claiming that B&N's Nook Color Tablet device and Nook e-reader contained Microsoft intellectual property found in the Android open-source mobile operating system.

ROI vs. TCO

- **Return on investment (ROI)** is largely focused on measuring benefits to see if they exceed the costs of implementing a specific IT project. An ROI calculation divides the benefits of a project by the costs and expresses that calculation as a percentage over a specific time period (usually three years).
- **Total cost of ownership (TCO)** simply adds up all the costs associated with a particular IT investment. TCO typically is used for comparative purposes, such as weighing the costs of open source against those of proprietary systems in order to determine which option is cheaper.

STACY COLLETT

Governance means different things to different open-source users. Walli puts open-source players into three categories: those who buy it, those who use it and those who make it. "Once you identify which bucket [you're in], it allows you to build a governance process that really speaks to those three different functions," he says.

Buying open source is like buying any other software for an organization. As part of the governance plan, IT managers can set up an internal website dedicated to open-source offerings, with a list of approved products for purchase, product numbers and downloads.

Using open source means downloading software without buying services or support from a vendor. "If you're just downloading [the open-source content management system] Alfresco — for example, the community edition — with your own knowledge base, then the skill sets you need are very different. You start allowing people to demonstrate what they have learned in-house," Walli says.

The governance plan should identify employees who are willing to help support the product inside the company and stay current with the community so they know when to apply security patches or deal with other issues that may arise. The plan should also specify the downloadable binaries that the employee is willing to support.

Developers often use pieces of open-source software as building blocks when they create applications (as in the Barnes & Noble case). "That's where you start caring about licenses and have discussions with internal counsel and explain to them things they need to consider" in the governance plan, says Walli.

The IT organization needs to maintain control of open-source policies and not let the legal team decide them, proponents say. Developers need to help attorneys understand the economic motivation for using open source and "get them away from the concerns over derivatives, plagiarism and lawsuits," Walli adds. He compares using open source to a lawyer writing a contract. The lawyer doesn't start from scratch; he borrows text from previous contracts that have been peer-reviewed and are known to work.

Do ROI and TCO need to be determined before a governance plan is set up, or will a governance plan lead to better ROI and TCO? It's a chicken-and-egg problem, Walli explains. "Governance is about how we're going to do something, whereas the ROI discussion is about why we're going to do it," he says. At any point in the company's open-source evolution, it's never too late to come up with a governance plan. Conversely, if open-source projects have a proven ROI, then it should be easy to develop rules around the best uses of open source in the organization.

At the end of the day, industry watchers say there's a balance between managing the risks of open source and managing opportunity. "It's fine if you react to potential risk, but the long-term view should be on maximizing the opportunity. Open source is inevitable across the entire technology ecosystem," Aitken says. "You can't afford to be an ostrich." ◆

Collett *is a* Computerworld *contributing writer. You can contact her at stcollett@aol.com.*

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Tools to Ease IT's Pain

Four startups offer fresh ideas for reducing enterprise IT headaches. **BY SANDRA GITTLEN**

IF YOU WANT TO KNOW what IT tools and technologies you'll be using in a few years, it pays to keep an eye on startups that are focused on enterprise technologies.

Venture capitalists and entrepreneurs agree that the IT startups that get funding these days are those whose offerings cut costs, relieve headaches and generally make CIOs' lives easier — without capital investments in software and supporting infrastructure. Investors are backing startups that aim to do just that with systems that handle tasks like IT resource tracking, cloud storage, virtualization and mobile device management.

Here are snapshots of four startups that are bringing hassle-saving IT products and services to the enterprise. Even if you don't end up using these specific products, chances are you'll check out something similar within the next year or so.

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1 Cloud-Based IT Resource Tracking: Apptio

For the past few years, IT has been under pressure to evolve and become a service provider for the enterprise instead of being a cost center. This means tracking business units' usage of IT resources, including labor, hardware, software, power and cooling.

AT A GLANCE

Apptio

Enterprise product: Technology Business Management suite

Pricing: Starts at $100,000 annually, depending on the number of users and modules deployed

Funded by: Andreessen Horowitz, Cisco Systems, Greylock Partners, Madrona Venture Group and Shasta Ventures

CIOs and other IT managers often develop bills of services using a combination of spreadsheets, business intelligence software, asset management systems and, in some cases, blind estimates, according to Sunny Gupta, Apptio's president, CEO and co-founder.

"IT executives are trying to manage IT without any real way to measure costs, quality of service and the actual value of IT products. They have management tools to measure individual aspects of IT — such as the network, bandwidth and mobile devices — but not as a holistic view," he says.

Apptio's Technology Business Management (TBM) software-as-a-service suite promises to give IT teams and corporate executives a consolidated look at all IT investments and their associated costs, showing the financial impact of client, infrastructure and application services, says Gupta. Authorized users can input data, run reports, view data via customized dashboards, or dispatch alerts based on predefined thresholds, such as a business unit's storage usage level.

IT also can create a "bill of IT" for each business unit to show its exact service consumption. Gupta says this is critical for forecasting, aligning budgets and developing an accurate chargeback program.

For instance, using TBM, a company might realize that employees are using 10 applications that perform similar functions. By standardizing on one, it could gain significant cost efficiencies in the form of volume pricing and streamlined support. Also, TBM offers what-if scenarios so organizations can weigh the pros and cons of granular business decisions, such as moving storage from the data center to the cloud or increasing the use of telepresence systems.

Gupta says that the Starbucks coffee chain started using TBM and discovered that the laptops it had deployed to cut desktop expenses were actually costing it more because of battery replacements and support issues. Armed with this information, the company was able to change its warranties and help-desk strategies to extract the savings it had initially anticipated.

Mark Gibbs, CEO of Gibbs Universal Industries (GUI), a consultancy in Ventura, Calif., says that as data centers become more complex, "IT resource tracking is as important as ever." And SaaS-based tools offer added benefits, such as easily deployed add-ons and instant feature updates based on requests and what-ifs that other companies use, he says.

However, he warns that IT teams must test how data gets into and out of these hosted systems to ensure that they interoperate smoothly with the tools that will feed them data, and to verify that accurate, real time information is used.

2 Cloud Backup for Web Apps: Backupify

Under strict scrutiny to make data recoverable and secure, IT is faced with an ever-growing challenge: controlling all the data that users generate in Web applications such as email, social media sites, and document-sharing and collaboration tools.

Enterprise Strategy Group analyst Lauren Whitehouse regards this issue as the Achilles' heel for most organizations in this era of third-party hosted applications and cloud storage. "When IT owns and operates applications, they are responsible to make sure that the application and data are available, which includes employing backup/recovery tools and other high-availability technologies. Now that more organizations are outsourcing applications, the issue of downtime and data loss is getting exposed," she says.

This is particularly a concern because many online service providers don't have well-defined service-level agreements, Whitehouse says. She calls

Continued on page 36

AT A GLANCE

Backupify

Enterprise product: Backupify Pro 500

Pricing: Starts at $19.99 per month for 10 users; additional users are $3 per month each. Includes both a social media account backup module and Google Apps domain backup.

Funded by: Avalon Ventures, First Round Capital, General Catalyst, Lowercase Capital, Betaworks and several individual investors

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Getting a handle on mobile device management is becoming an increasing priority for many organizations.

SCOTT CRAWFORD, ANALYST, ENTERPRISE MANAGEMENT ASSOCIATES

Continued from page 34

services like Backupify "an insurance policy."

Backupify is a SaaS-based system that backs up data from Basecamp, Facebook, Gmail, Google Docs, Twitter and other online applications to Amazon's S3 storage cloud network. "IT struggles because users are creating data in all these silos around the Web, and that data is exposed to hacking and viruses. It's also prone to loss from human error," says Backupify CEO Rob May. By centralizing user data in Amazon's environment, IT managers can apply security and de-duplication policies for compliance without building out their own storage infrastructures, he says.

For example, to back up Google Apps, IT registers the accounts to store in Backupify and receives emails confirming each completed backup, as well as access to archives and downloads. The social media backup module works similarly; IT can register each service and user it wants backed up.

Backupify is appealing to companies that must comply with data retention rules, such as those in financial services and healthcare, because it enables them to have the benefits of social media and Web-based applications without increased risk, May says.

3 Mobile Device Management: Klomptek

One of an IT manager's most urgent needs these days is controlling mobile devices in the enterprise. Tracking and securing lost and stolen mobile devices has been difficult for IT, but given that many smartphones and tablets have access to corporate data, the ability to locate them, lock them down and erase them if they go missing is critical.

"Getting a handle on mobile device management is becoming an increasing priority for many organizations, particularly if they have access to sensitive data or functionality," says Scott Crawford, an analyst at Enterprise Management Associates, a consultancy in Boulder, Colo.

Klomptek developed Track and Protect to secure IT's investment in mobile devices and the data stored on them, says founder and CEO Robert Harmsen. An online service, Track and Protect can be managed centrally by IT or individually by users.

Once a device is registered with Track and Protect, IT or a user can go to a personal, secure Web page to take steps to control and locate it if it's lost or stolen. From that page, which can also be accessed via mobile phone browsers, a user can send SMS-based commands to lock a phone, silence it so it doesn't attract attention, use GPS (if available) to locate it, or have the phone call another number and amplify the microphone so the user can hear what's going on around the device. For instance, a user might recognize the sounds of a train station or children playing in a park.

Other options include sending a text message to the phone to announce a reward for its safe return, accessing the phone's history — including numbers dialed and data sent — or remotely activating the phone's camera so the user can see the device's location or take a picture of the thief.

Track and Protect enables remote lockdown of a device based on personal preferences, such as three failed password attempts. IT or a user can remotely wipe a compromised phone, and the service can automatically back up stored data from the phone before it is wiped.

Harmsen says Track and Protect is different from its competitors in that it uses an encrypted SMS transport layer to carry out all of those functions. Regardless of the device's platform, Track and Protect can interact with the phone, even if it has been turned off, the SIM card has been removed or the battery is low.

Track and Protect is available in 190 countries, including the U.S. Klomptek is targeting countries where phone theft is prevalent, such as Russia, Brazil, China and

AT A GLANCE

Enterprise product: Track and Protect

Pricing: Free to download the application. Prepaid packages are available — for instance, 10 commands cost $5.99, and 45 commands cost $19.99, depending on geographic region.

Funded by: Privately funded by founders

Indonesia. "Say you were traveling abroad and lost your phone. You could go to an Internet cafe, log in to your Track and Protect Web page, and locate it or secure the data," Harmsen says.

"Hosted mobile device management may offer an advantage when the hosted service can be accessed from the same public networks as these mobile devices," says Crawford. "This potentially improves the ability to reach and manage these devices wherever found."

4 Database Virtualization: Delphix

One task that can consume a lot of IT's time, not to mention data center infrastructure, is database cloning. Test and development, data warehousing, and support teams, among others, request copies of production databases on a regular basis. Each time, IT must provision server and storage resources to house all those database copies.

Moreover, the data becomes stale almost as soon as it is duplicated, and it can be difficult for IT to track the different versions in existence to delete them and reabsorb the underlying resources.

Startup Delphix has developed Delphix Server to virtualize databases. Essentially, the software creates full read/write clones of Oracle 10 and 11 production databases. These clones are automatically generated from abstracted snapshots and log files, and they require a tenth of the storage space that physical databases need, according to Karthik Rau, vice president of products and marketing.

The virtual database regularly syncs with the production database; only changed data is sent to the virtual database, reducing the infrastructure workload.

Overall, Delphix aims to consolidate data center resources and speed application testing, development, deployment, management and upgrade cycles.

In addition, Delphix's secure self-service portal lets IT set policies and allot storage so users can fulfill their own requests. For instance, if a developer needs a copy of the company's ERP database, he can provision it himself. This guarantees fast access to the freshest data, and when his project is complete, the virtual database can be deleted and the resources reabsorbed.

AT A GLANCE

Delphix

- **Enterprise product:** Delphix Server
- **Pricing:** Starts at $2,000 per month for an annual subscription
- **Funded by:** Greylock Partners and Lightspeed Venture Partners

Rau says that, perhaps most important, Delphix Server ensures the accuracy of data and reduces production environment risks, since users can create and recover the virtual databases from any point in time. Using "true" replicas of the databases increases the quality and stability of the application in production.

"Since creating virtual databases requires no additional storage capacity and is fully automated through Delphix Server, developers can spin up virtual databases on the fly and create significantly more database environments with little to no additional infrastructure investment," Rau says.

GUI's Gibbs says the ability to virtualize databases is valuable for IT organizations. "For a large database like Oracle, being able to just click and spin up another version reduces the drag on IT and would let developers get on with their jobs quickly." ◆

Gittlen *is a freelance technology writer in the Boston area. Contact her at sgittlen@verizon.net.*

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San Diego's North County Transit District sells solar-generated power back to the local utility to earn credits on AC power use.

DATA CENTERS

Powerful Experiments

Solar arrays, gas turbines and fuel cells are among the innovative options for powering data centers. **By John Brandon**

DATA CENTER power usage is soaring — the U.S. Environmental Protection Agency estimates that data center energy requirements will double in the next five years.

To address that surge in energy use, some companies are turning to alternative sources of energy, including solar arrays, natural gas turbines, wind power, fuel cells and hydro power. But one big question is whether these power sources will deliver a return on investment in the near future.

Ted Ritter, an analyst at Nemertes Research Group, says many companies are having a hard time justifying an investment in alternative power sources right now — especially if it means completely replacing the reliable AC power already coming into their buildings, as opposed to merely supplementing it.

But some users are forging ahead with alternative energy projects anyway, figuring on a payoff within 15 years.

For the North County Transit District (NCTD) in San Diego, solar was the most obvious choice for alternative power. The organization's data center is relatively small, but it's big enough to enable the agency to handle ticketing for 12 million public transportation users annually and process video from security cameras in transit stations.

Angela Miller, the transit agency's CIO, says her group felt a need to be a better environmental citizen. As part of a data center redesign, the agency spent about $600,000 on a 30-panel solar array, invested in virtualization technology for server and storage systems, and bought new pods that pull hot air out and help cool equipment inside the racks.

The NCTD sells solar-generated power back to the local utility to earn credits on AC power usage (which is allowed under California law), meaning the solar initiative has become a profit center. The solar panels don't generate power for the building directly.

It works like this: The local utility sells AC power to the NCTD, then the agency sells the utility the solar energy for a 100% credit. The agency has a five-year plan in place to offset all AC power in its data center. The NCTD generates up to 450 kilowatt-hours of electricity, and it plans to reach 1 megawatt-hour in five years.

"Solar is what has made the [data center redesign] project even have an ROI," says Miller.

Bob Mobach, a consultant at systems integrator Logicalis

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Open Invention Network (OIN) has considerable industry backing. It was launched in 2005, and has received investments from IBM, NEC, Novell, Philips, Red Hat and Sony.

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Group, helped the NCTD redesign its data center. He says a key to realizing an ROI with alternative power is embracing virtualization. The agency's data center is about 80% virtualized, and that's a primary reason why the solar arrays are such a successful power source.

"Virtualization was critical for so many reasons," says Miller, noting that the new setup is "way more efficient," makes better use of hardware, gives the data center a smaller footprint and is easier to manage with fewer people. "My actual physical footprint went from not having any more slots in the racks available to having only half of the racks occupied, and yet we've increased our applications this year," she says.

» CIO ANGELA MILLER says virtualization was critical to the success of NCTD's solar project.

Analysts laud efforts like the NCTD's but warn that solar power isn't right for every data center. "The level of efficiency you can get out of solar energy is dictated by the location of the data center," says Forrester Research analyst Doug Washburn. "If you are in an area where the sun shines more frequently, you can take advantage of a solar investment."

One reason why solar may not be the best data center power source is the fact that data centers use 10 to 100 times more energy per square foot than a typical office complex, Washburn says. Moreover, resiliency and uptime are so crucial to a data center's operation that "it's a critical risk, and maybe even foolhardy to think you could power the majority of your data center from solar," he adds.

Washburn agrees that virtualization is key to the success of a solar project. Increasing the number of hosts per machine, consolidating storage and decommissioning equipment that has been virtualized can make a data center more efficient even before an energy switch-over, he says.

Power From Jet Engines

Christopher Sedore, the CIO at Syracuse University, says the upstate New York school spent about $12 million to build a data center that uses natural-gas-fired microturbines from Capstone Turbine to generate power on-site.

Microturbines are essentially jet engines that run on natural gas and provide power to generators. The turbines produce about a half a megawatt of power for the university's data center and another 200 kilowatts for other uses, such as powering an adjacent building.

The turbines enable the university to have a co-generation setup, meaning they can help generate both heat and power for the data center or nearby buildings. The university can also sell any extra power the turbines generate back to the local power company.

The turbines drive two 150-ton absorption chillers that turn the heat exhaust from the turbines into chilled water that cools the data center. In the winter, the university uses cold outside air for data center cooling, and hot water generated by the turbines is used to heat an adjacent building.

Banking on Fuel Cells

One of the most promising new technologies for powering data centers is the hydrogen fuel cell. Hydrogen fuel cells don't produce any harmful emissions, so companies such as Verizon, Whole Foods and Google have adopted them as an alternative power source for office or retail space.

Few organizations use fuel cells to power data centers, because they are expensive. But First National Bank of Omaha built a 200,000-square-foot fuel-cell-powered data center in 1999 because such systems tend to be especially reliable. The data center is about the size of a football field; it's surrounded by a dry moat and is powered entirely by four 200-kilowatt fuel-cell generators. If the data center does lose fuel cell power, which is extremely unlikely, an uninterruptible power supply can carry a short-term load.

"With the fuel cells, we have seven-9s of reliability, or about 2 or 3 seconds of downtime per year," says Brenda Dooley, president of First National Buildings, a bank subsidiary that handles corporate real estate and facilities management. "We came from a system with backup batteries. When we'd lose power, the batteries just wouldn't be there. We did this for reliability."

Dooley explains that the credit card processing that's done at the data center requires high reliability: Just one hour of downtime could result in a loss of as much as $6 million.

The bank knew that using fuel cells would be expensive. In Nebraska, AC energy costs only about 5 cents per kilowatt-hour, whereas electricity from fuel cells costs about 12 cents per kilowatt-hour. It would have cost $2.2 million to build a data center that used AC power; using fuel cells raised the price tag to $3.4 million. Dooley says fuel cells are worth the higher price, and the ROI is excellent because the bank doesn't suffer lost transactions.

Of course, other enterprises might not be willing to pay such a high price for great reliability. "Fuel cell technology is not there in terms of volume and scale to support larger data centers," says Nemertes' Ritter. "But down the road, it is very interesting potentially as a backup power source."

Alternative power has a bright future for data centers. Ritter says there may be no other option in the coming years, if traditional-energy prices continue to soar. Whether it's solar power, gas turbines, fuel cells or some emerging option — such as harnessing the power of ocean waves — it's clear that new energy sources will play a role in the data centers of the future. ◆

Brandon *is a former IT manager who now writes about technology.*

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Hallmark's Fresh Start

The greeting card company **built a new, faster website** and saw a 30% uptick in its customer conversion rate. **By Patrick Thibodeau**

FOR MONTHS, Hallmark Cards had been building a new website in parallel with its old one. Late one night last September, Hallmark's online team arrived at its moment of truth: the switch-over.

Would the new site work? Paul Barker, vice president and general manager of Hallmark Digital, which manages the company's online presence, wasn't sure.

"We were all standing around waiting for it to break, waiting for it to crash, and it didn't — it was a real confidence booster for the entire organization," Barker says.

But he still had concerns. Would conversion rates, or sales, be hurt? The project was a complete re-architecture and platform shift.

"We expected to have a lower conversion rate because we thought, with a new site, it was going to take some time for people to get used to it," Barker says. Instead, Hallmark reports that its conversion rate increased by 30%.

The company also says customers experienced a 370% improvement in site response time. On the old site, "response time would erode significantly at the peak times," Barker says. "That was unacceptable."

The improvement began when Hallmark hired Savvis as its hosting provider and Infosys, an India-based service provider, as its primary application developer. Response times from 2009 to 2010 improved by a factor of two or three, but after the new Hallmark.com went live, the average response time for the month of December improved by more than 50% from the previous year.

The exact before-and-after response times weren't immediately available from Hallmark, but Ken Godskind, chief strategy officer at AlertSite, a Web performance management company, says the previous figures "must have been really scary" if Hallmark is reporting a 370% improvement.

At *Computerworld*'s request, AlertSite benchmarked Hallmark.com's home page from 12 cities on the afternoon of April 13 and came up with an average response time of 2.47 seconds, putting it at about 15th in AlertSite's most recent ranking of response times for the retail sites it monitors.

Barker says that AlertSite's findings mirror Hallmark's data. "We feel we are performing very well," he says.

Prior to the switch-over, Hallmark was adding a growing catalog of features that included a loyalty points program, address books and reminders of key events such as birthdays. And it was adding that functionality to a site that offered more than 5,000 products.

The additions produced a complex code layer that hurt performance and made it difficult to add new customer features. That's why Hallmark decided to remake its site. "This gave us an ability to have a fresh start," Barker says.

The company stopped using IBM's WebSphere software and switched to Microsoft's .Net, because Microsoft offered lower licensing and maintenance costs.

Barker doesn't credit any single change with the conversion rate increase. For example, he points out that optimizing search and navigation also made it easier for customers to find products.

Khalid Saleh, co-founder of Invesp Consulting, which helps companies improve their conversion rates, says it's hard to pin upticks in sales on improved response times, but when the average response time drops from 12 seconds to 5 seconds, "you can see a huge uplift in customers" — and conversion rate increases of as high as 12%.

Barker says the experience has given his organization "a lot of confidence that we can take on even more — whether more services, products or functionality." ◆

IMAGE COURTESY OF HALLMARK

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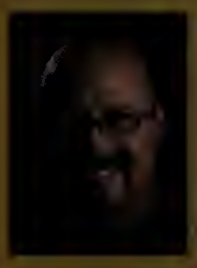

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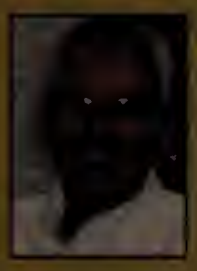

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CAREERS

Data Center Double Duty

Studies show that **IT workloads are rising** as technology is added but staffing levels plateau. **By Patrick Thibodeau**

DATA CENTERS continue to be filled with more and more IT systems, but enterprises aren't necessarily hiring more people to manage that new equipment, two surveys have found.

In a survey conducted in March by AFCOM, a data center managers group, 37% of the respondents said they had reduced their data center staffs over the past three years, and 29% said they kept their staffing levels the same. The balance, nearly 35%, increased staffing.

But over that same period, nearly 74% of the data centers increased their physical server count, according to the AFCOM poll of 360 IT managers and other senior IT executives.

The upshot is that 66% the data centers covered in the AFCOM survey are managing more systems with the same number of people or fewer.

A separate study by Metrics Based Assessments, also released in March, explains what's happening.

MBA, a data center research firm that benchmarks about 100 data centers annually, reported that in 2006, the number of Linux operating system images supported by the equivalent of a single full-time systems administrator was 9.2, but by 2010 it was 17.1, an 86% increase. Over that same period, the number of Windows images supported by a single full-time staffer increased 61%, and the number of Unix images per staffer rose 38%, according to MBA.

"What we're really seeing is that people are adding capacity, but they are not increasing staff size, and somehow the staff is figuring out how to deal with it," says Mark Levin, a partner at MBA. "And a lot of it has to do with improved levels of automation or things of that nature."

But even with technical improvements, Levin says, productivity gains are being achieved because data center workers are simply taking on more work.

"Server virtualization, server management software and data center automation are making the data center more efficient," says John Longwell, vice president of research at Computer Economics, an IT research firm in Irvine, Calif. "At the same time, server counts are still rising, despite all the yakking about server consolidation and data center consolidation."

But this is also a consistent long-term trend. Computer operators (now called systems administrators) used to account for about 10% of the IT staff back in 1997, says Longwell. Today, they account for 3.3% of the IT staff.

Another major trend that's shaping data centers is the growth of cloud computing. In October 2009, only 14% of data centers had implemented any form of cloud computing, according to the AFCOM survey. That figure now stands at 36%.

"Our prediction is that 80% to 90% of all data centers will be adopting some form of cloud computing in the next five years," says Jill Eckhaus, CEO of AFCOM, which has made cloud computing a priority in its training programs.

Eckhaus says data center managers are more interested in private clouds for control and security reasons, but she notes that AFCOM's adoption estimate also includes use of public cloud services.

In terms of budgets, nearly 38% of the respondents to the AFCOM survey said they expect their companies to increase their data center budgets in 2011, while 41% said they expect funding to remain the same and 20% said it would decline.

Eckhaus says the survey also found that 15% of the data centers don't have data backup and recovery plans, and about 30% don't have backup sites. "To me, these statistics are shocking," she says.

Levin says he isn't surprised by the lack of spending on or attention to disaster recovery. "We thought after 9/11 there would be a significant increase in disaster recovery spending — it never happened," he says. ◆

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Security Manager's Journal

MATHIAS THURMAN

When Email Gets Hacked

An executive's webmail account is compromised, and it contains plain-text passwords for corporate apps.

THIS WEEK, one of our C-level executives suffered a personal security incident that spilled over to the workplace. Here's what happened.

The executive's Yahoo email password was compromised, which she learned after hearing from friends who told her that they had received messages from her requesting money to deal with a crisis. You've probably heard similar stories, but whoever hacked the executive's email was a bit more clever than the average cybercrook. One friend was suspicious of the request and asked for verification of the executive's identity. Most email hijackers would probably give up and move on to another victim at that point, but this hacker had sifted through the executive's emails and learned enough about her family, vacations and health issues to trick the friend and dupe her into wiring the money.

Naturally, the executive had used her Yahoo Mail account for a variety of activities, including setting up accounts with her bank, her brokerage, an airline and various shopping sites. The Yahoo account had received emails containing clear-text passwords when she had forgotten them. Worse, she often used the same password for multiple accounts.

I advised her to abandon the email account and to contact all of her friends and let them know that they should disregard any mail from that address. But that action, or simply changing the password, probably wouldn't be enough to stem the damage. Most identity thieves will download all the email from a compromised account, as well as data such as calendars and contact lists, to a local computer. This is quite simple, since many webmail clients allow customers to use more feature-rich email clients such as Microsoft Outlook to download email. So even if the account were shut down or the password changed, the hacker would probably still have all of its contents.

the discussions about security! **computerworld.com/blogs/security**

Because the compromised content could not be safeguarded, I also told her to file a police report; contact all banks, credit card companies, brokerages and other organizations with which she had done business online; file a fraud alert with the major credit agencies; sign up for a credit-monitoring service; and obtain a new email address and update all of her accounts with that address. I also warned her to refrain from using any PCs, including her home PC, until we could verify their integrity, since we still didn't know how her password had been compromised.

"The executive gave me a list of seven SaaS apps that had sent password reset notices to her compromised account.

Trouble Ticket

» A C-level executive's Yahoo Mail client was hacked, opening the way for the hacker to get into the corporate network.

» Change all her SaaS and domain passwords, fast.

Dangerous Habit

In the course of our conversation, I learned that this incident had implications for the company. You see, we have increased our use of software as a service to the point that we now use more SaaS offerings than on-premises applications. Some might see this as an achievement. I see it as a security nightmare.

As I've explained in past articles, most SaaS vendors have focused more on functionality and accessibility than on security. This incident is a perfect example of how that approach can lead to problems. The executive had a habit of forgetting her passwords for SaaS applications, and she gave me a list of seven SaaS apps that had sent password reset notices to her hacked email account — in clear, unencrypted text!

Fortunately, none of the data used with these particular apps was extremely sensitive. But she had used her domain password for all of the applications. This meant we had to change her domain password and then log in to all the other applications — about 15 altogether — that were not synchronized with Active Directory or configured for single sign-on.

Needless to say, this was not a good day for this executive. But on a positive note, I did get a sponsor for my security awareness and training program. ◆

This week's journal is written by a real security manager, ***"Mathias Thurman,"*** *whose name and employer have been disguised for obvious reasons. Contact him at mathias_thurman@yahoo.com.*

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OPINION

BART PERKINS

What Suppliers Can Tell You About Your Own Business

> Strategic suppliers share your most crucial goal: your long-term success.

SO, YOU'VE SET UP A PREFERRED SUPPLIER PROGRAM to obtain maximum value from all of your IT suppliers. You design your IT contracts to get the best combination of cost and service for desired products, then monitor performance against the contract.

But are you really getting the most from these relationships?

Few companies with preferred supplier programs consult even their most strategic suppliers for input on creative ideas to improve IT. They're missing out, because many suppliers can offer valuable insights. Think about it. Strategic suppliers share your most crucial goal: your long-term success. These suppliers work with many companies in a variety of industries, giving them a broad perspective that enables them to objectively gauge the relative effectiveness of different approaches to IT challenges. And their employees can provide suggestions unhampered by corporate politics.

A supplier's fresh perspective could be helpful in several areas, including these:

Internal policies and procedures. From inside an organization, it's easy to turn a blind eye to processes that work but aren't truly robust. But outsiders aren't committed to the status quo. In fact, suppliers often have incentive to make a client's internal processes more efficient — for example, via outsourcing contracts that are priced with the assumption that the outsourcer will standardize processes and reduce associated costs. And a supplier's staff will never believe that "we've always done it this way" constitutes a best practice.

And what suppliers observe often goes beyond processes covered in the contract. For example, the executive management team at one Fortune 500 company, having sought fixed bids for all new application work, was mystified when all the major systems integration firms declined to bid. Then a service desk outsourcer explained that the company's requirements documents had consistently been incomplete, often resulting in massive additions and changes during a project. For the integrators, the fixed-fee contract was too great a risk. Management now demands comprehensive and detailed requirements.

Employee evaluations. You might use 360-degree reviews and organizational climate surveys, but you can still get additional insights from your suppliers. The major drawback of employee opinion surveys is that many employees believe that management can and will figure out who wrote which responses. The result is that many responses are guarded. Your suppliers' representatives, however, can offer an objective perspective on your staff's skills and morale, both from firsthand experiences and things your employees have said to them.

New trends. Strategic suppliers can alert you to industry trends long before they appear in the trade press. When a supplier informs you of an emerging trend — without a related sales pitch — pay close attention.

Some companies ignore or reject advice from external sources, on the grounds that "we know our business best." This view is shortsighted. Suppliers offer an invaluable perspective, both within and across industries. But some suppliers are hesitant to volunteer information. They might assume that you already know about existing problems, or fear that they might offend you by drawing attention to weaknesses. Either way, it's up to you to ensure that this potentially crucial exchange of information takes place.

Leverage your suppliers' insights to foster mutual success. In the end, everybody wins. ◆

Bart Perkins is managing partner at Louisville, Ky.-based Leverage Partners, which helps organizations invest well in IT. Contact him at BartPerkins@LeveragePartners.com.

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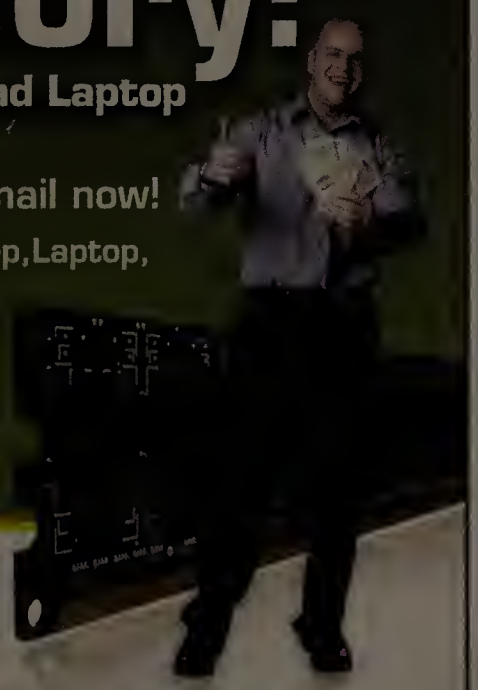

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Career Watch

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Tech Jobs Rise in Rust Belt

If you're willing to relocate to get a job in IT, then you might want to consider the U.S. city with the fastest growth in tech jobs last year: Detroit. The Motor City topped the list when Dice.com looked at all its job postings for February 2011 to determine the places where job growth was strongest.

Naturally, Washington/Baltimore, New York/New Jersey and Silicon Valley still had the most openings, says Dice. But Detroit greatly outpaced them in terms of the percentage increase from February 2010 levels. And Detroit was far from the only Rust Belt city to make the top 10.

METRO AREAS WITH FASTEST TECHNOLOGY JOB GROWTH	% INCREASE
DETROIT	101%
CINCINNATI	75%
CLEVELAND	62%
COLUMBUS, OHIO	57%
SEATTLE	54%
PITTSBURGH	45%
MIAMI	43%
JACKSONVILLE, FLA.	41%
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ASK A PREMIER 100 IT LEADER

Jay Leader

The CIO at **iRobot** *answers questions about the value of training in public speaking, how to talk to job interviewers and more.*

My boss wants me to take a course in public speaking, which terrifies me. I also don't see the point. He's not the sort of person you question, so I'll ask you: Why would a backroom IT guy need to bother with this? Public speaking is a critical skill that is valuable to anyone, regardless of their general duties or responsibilities. It's critical to be able to clearly articulate a point of view, proposal or solution to those who are impacted, and I'm sure you will be surprised by the number of times you will be called on to make these kinds of presentations. I can think of many occasions where you'll be called upon to speak as a "backroom IT guy" – to gain approval for a major infrastructure purchase, or outline the need for and details of a necessary system outage, for example. Adding public speaking ability to your personal toolbox will be a very worthwhile investment.

Since being laid off nine months ago, I've had a few interviews, but they haven't gone well. The problem has been

that the interviewers don't seem to know much about technology, and so they have no way of evaluating the validity of my responses. I've begun to wonder, though, about the people they end up hiring. Are IT jobs going to less technically adept people who just know how to talk to interviewers? More than ever, IT jobs are being filled based on "soft" skills like communication, teamwork and cultural fit as much as they are on pure technical capability. Many interviewers (myself included) don't use the interview process to assess your technical skills, but rather to evaluate these type of factors. I think it's always important to know (and it's perfectly fine to ask) what each interviewer is looking for from the interview so that you can tune your responses to fit their needs. Talking about bits and bytes to a person who's assessing your cultural fit with the team or organization is a natural mismatch of expectations, so work hard to understand each person's role and background before you show up to interview.

If you have a question for one of our Premier 100 IT Leaders, send it to **askaleader@computerworld.com**, and watch for this column each month.

Sometimes I feel like the lone woman in an old boys' club when the IT directors get together. I hold my own on the technology and business issues, but a lot of the discussion is devoted to football and golf. In itself, that doesn't annoy me, and I pay enough attention to sports to not feel entirely left out. Still, I'm usually the one who directs everyone to the business at hand, and I think I'm getting labeled as the killjoy. Now, that does annoy me, because I'm actually a fun-loving person. Is this something I should even worry about? I don't think you should worry, but I also think it's important to understand the dynamics of your work environment and be able and willing to adapt yourself to the culture and behaviors that exist in your specific situation. Cultures are typically bigger than individuals, and trying to change them to suit your own particular preferences might lead others to believe that you're "not with the program." Building relationships is critical to being effective, and if you can find common (though perhaps not ideal) ground to use as a basis for relationship-building, you'll have a much better chance to be viewed as a team player.

I am working in the U.S. on an H-1B visa. Most of my colleagues have been helpful, some have been welcoming, but a few have been openly hostile. I try not to take this personally; I know there is much anguish and debate over my type of visa. But how should I handle these coworkers? Most people are reasonable and supportive of colleagues trying to build a career, but there are always a few who will look for the negatives in any situation. You didn't author the H-1B program and aren't accountable for its positives and negatives; you're simply trying to follow the defined process and secure an opportunity to build a career as offered through the program. I think being open and honest about your intent and motives will carry the day with your reasonable colleagues, and all you can ask and expect from the rest is understanding, if not agreement.

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SHARKTANK

TRUE TALES OF IT LIFE AS TOLD TO SHARKY

HAL MAYFORTH

'For Cause,' Defined

It's the 1980s, and this pilot fish has just started working for a data processing company. "Shortly after I began, one of the developers was let go for cause," fish says. "The next time payroll was run, it aborted halfway through. No one could find the cause, and since this program was the baby of the recently departed developer, he was called in to help. He agreed to come back as a consultant — at three times his previous salary. The company didn't like it but had no choice. I was asked to sit with him to see how to fix the problem if it happened again. Over the next three days, I saw that the cause was a procedure he had written, buried deep in several layers of programming. That procedure queried the table of employee information, and if the query revealed that the developer's own Social Security number wasn't present or that his 'active' status was 'N,' the program was told to abort. He offered to update the procedure to look for my SSN. I declined — and understood then what 'for cause' meant."

Your Tax Dollars At Work

IT manager at this government agency decides to test 80,000 pages destined for the agency's website to make sure they don't contain any text that a screen reader can't read, so he hires a pricey consultant to check each page in a browser, reports a pilot fish on the scene. "When I asked my boss why he had selected an enterprise data architecture analyst to do this job, he said, 'I wanted the best.' I think he hired the most expensive one on a list of consultants," fish says. "Though it wasted a fortune in tax money and delayed deployment by a whole month, it wasn't all bad. The consultant himself was an OK guy. He knew my program had generated the pages he was checking and that they were all clean. But he smiled as he dutifully opened each one in Firefox, saying it was the easiest gig he's ever had."

What Do We Need Them For?

This consultant pilot fish is redesigning the website user interface for a big investment firm. "I was in the planning meeting, and I mentioned that we should interview and pick the brains of some of their key users so we would have a solid design," says fish. "The senior business sponsor said that we wouldn't need to talk to users because the business already knew what was needed. It was a meeting with a dozen key players, so I felt a need to stress that it would be a good idea to employ a user-centered design to better ensure a favorable outcome. The business sponsor looked me in the eye and said, 'There are other ways to do user-centered design than bothering with actual clients.' "

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Framingham, MA 01701-9171
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Fax (508) 875-4394

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OPINION

THORNTON A. MAY

It's the Data, Stupid

> Today, making decisions without data is inexcusable, if not anachronistic.

THE GREAT RECESSION is hopefully now behind us, but its effects will be with us for eternity. That's because the recession fundamentally changed how people think about the world, in two ways.

First, it focused a harsh spotlight on the quality of decision-making in the modern enterprise. Second, and probably more significantly, it called into question the legitimacy of the leaders making those decisions. Martin Wolf, associate editor at the *Financial Times*, summed up the whole tragic scenario when he said that most people "no longer believe that [executives] know what they are doing."

The only way we can win back the trust of those we would lead, those who would buy from us and those who would invest in us is to become data-based leaders. Organizations that do not embrace the realities of big data, employ the services of data scientists and banish data-challenged CEOs will fail, and fail quickly.

An important potential first step on the path to resuscitating trust in leadership is to ascertain where your CEO stands vis-à-vis data-based leadership. I was very surprised to discover on the blog of Ben Horowitz, who with Marc Andreessen is co-founder and general partner of the venture capital firm Andreessen Horowitz, the following evaluation of CEO decision-making:

"Every decision that a CEO makes is based on incomplete information. In fact, at the time of the decision, the CEO will generally have less than 10% of the information typically present in the ensuing Harvard Business School case study."

As a student of management, I will be the first to agree that it is a rare occurrence for a decision to be made with full certainty and 100% of the information required. But I differ violently with Horowitz when he celebrates the courage of CEOs who make decisions under circumstances of 90% ignorance. That is not leadership. That is sloth. These are CEOs who are too lazy or too self-reverential to do the hard work required to gather the data that would inform a prudent decision.

Today, making decisions without data is inexcusable, if not anachronistic — it's inconsistent with realities of the present day or the big-data future toward which we are hurtling. Reid Hoffman, the executive chairman and co-founder of LinkedIn and a partner at venture capital firm Greylock Partners, told the tribal elders of Silicon Valley that he believes the next big thing — the real meat in the hype sandwich called Web 3.0 — will be data.

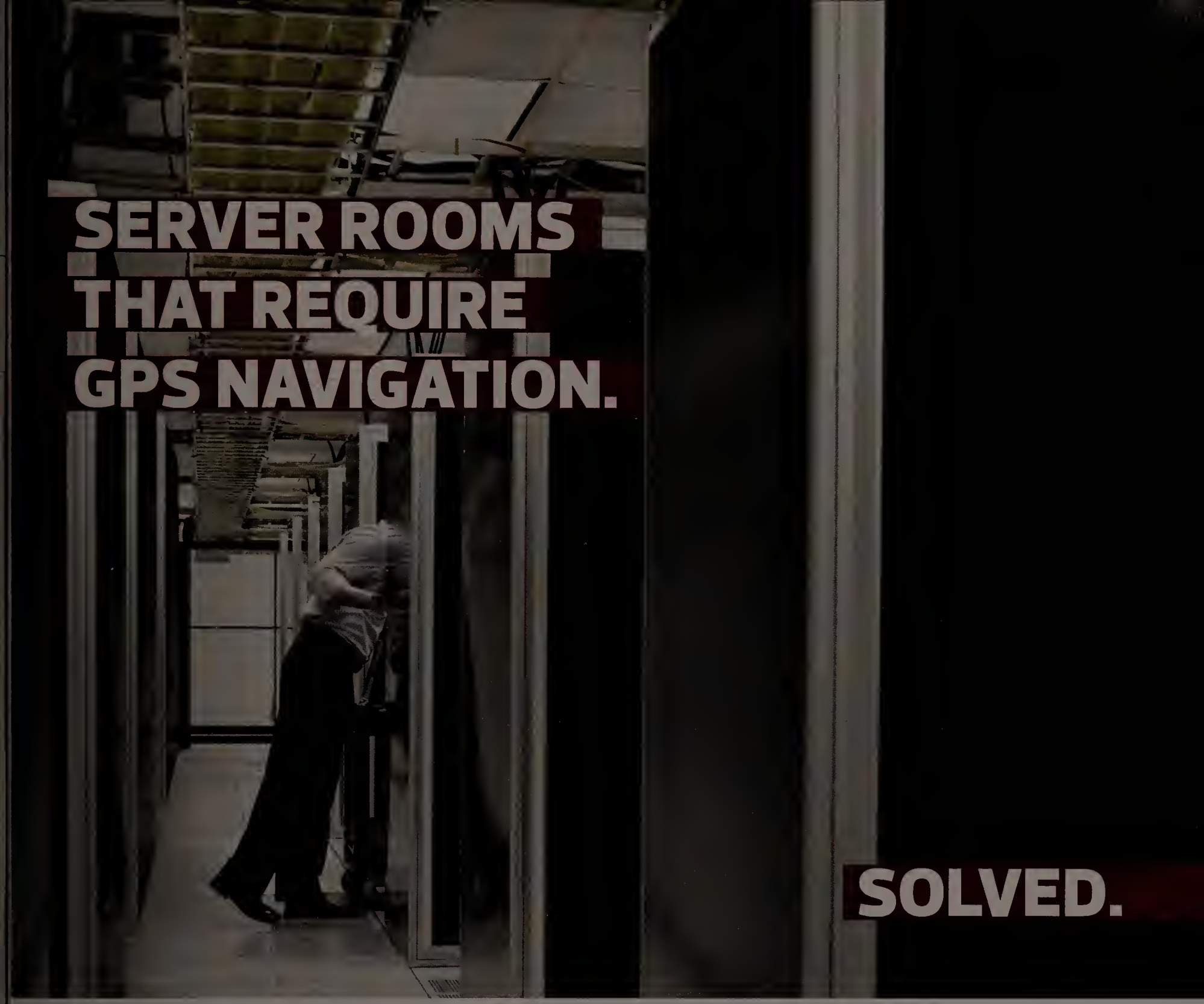
My research supports Hoffman's forecast. Post-Great Recession, I have been going door to door in the nation's C-suites seeking to assemble a composite take on enterprise decision-making. Several environmental truths have emerged. And Truth No. 1 is that sometime between Bernie Madoff going to jail and the U.S. government bailing out the banks, the world rediscovered data. The world is awash in data. Everyone is a data user and creator. Everyone emits a trail of digital exhaust that is machine-readable and algorithmically analyzable.

But not everyone is a data scientist. And every organization needs one.

While data has been exploding around us, another, less-commented-upon phenomenon has occurred: A select group of professionals skilled in obtaining, scrubbing, exploring, modeling and interpreting data has set up shop in high-performance organizations. These are data scientists, creating high-value products from the raw data that constitutes the digital world we live in.

And the CEOs who deserve to lead are creating a space in the enterprise for them. ◆

Thornton A. May
is the author of *The New Know: Innovation Powered by Analytics* and executive director of the IT Leadership Academy at Florida State College at Jacksonville. You can contact him at thorntonamay@aol.com.



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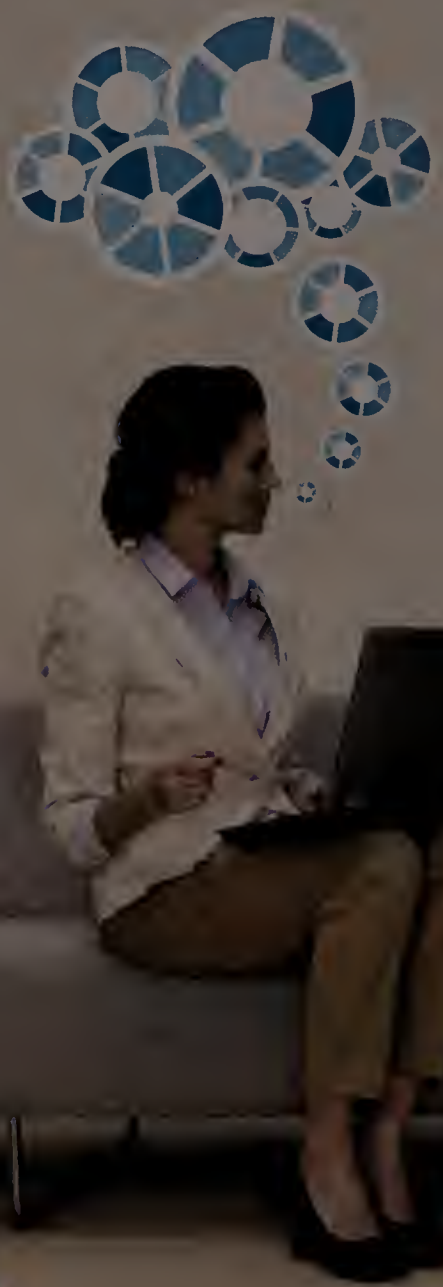

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